

Lab: Series and Parallel Circuits

Purpose: To explore the differences between series and parallel circuits.

Materials:

- 3 light bulbs (of the same voltage)
- 2 batteries (1.5V each)
- switch
- voltmeter
- ammeter
- connecting wires

Part A: Series Circuits

- 1) Build circuit a shown below.
- 2) **Measure** the **current** of the circuit and the **potential difference** for the light bulb.
- 3) **Add another light bulb** in series (circuit b).
- 4) **Measure** the **current** of the circuit and the **potential difference** for the first light bulb.
- 5) **Add another light bulb** in series (circuit c).
- 6) **Measure** the **current** of the circuit and the **potential difference** for the first light bulb.
- 7) Record any changes in **bulb brightness**.

Series Circuit

Number of light bulbs	Current (amperes)	Voltage drop (volts)	Bulb brightness
1 bulb			
2 bulbs			
3 bulbs			

Part B: Parallel Circuits

- 1) Build circuit a shown below.
- 2) **Measure** the **current** of the circuit and the **potential difference** for the light bulb.
- 3) **Add another light bulb** in parallel (circuit b).
- 4) **Measure** the **current** of the circuit and the **potential difference** for the first light bulb.
- 5) **Add another light bulb** in parallel (circuit c).
- 6) **Measure** the **current** of the circuit and the **potential difference** for the first light bulb.
- 7) Record any changes in **bulb brightness**.

Parallel Circuit

Number of light bulbs	Current (amperes)	Voltage drop (volts)	Bulb brightness
1 bulb			
2 bulbs			
3 bulbs			

Discussion:

- 1) How does the total current change as more bulbs are added:
 - a) in series?

 - b) in parallel?

- 2) How does the potential difference of the light bulb change as more bulbs are added:
 - a) in series?

 - b) in parallel?

- 3) How does the brightness change as more bulbs are added:
 - a) in series?

 - b) in parallel?

- 4) What would happen if you unscrewed one of the light bulbs in:
 - a) the series circuit?

 - b) the parallel circuit?